Avaya Solution & Interoperability Test Lab

Application Notes for Extreme Networks Summit 300-48 PoE with Avaya 4600 Series IP Telephones and Avaya Wireless Access Points - Issue 1.0

Abstract

These Application Notes describe how to configure the Extreme Networks Summit 300-48 to provide inline power for Avaya 4600 Series IP Telephones and Avaya Wireless Access Points. The various Avaya powering arrangements are shown and the administration commands for displaying and controlling the powering status of the switch ports are demonstrated. All test cases completed successfully. Information in these Application Notes has been obtained through compliance testing and additional technical discussions. Testing was conducted via the Developer*Connection* Program at the Avaya Solution and Interoperability Test Lab.

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1. Introduction

Power over Ethernet (PoE) is a feature offered on Ethernet switches. It allows the switch to supply power to a network device within the same cable that carries the Ethernet signaling. This simplifies network installation and powering design, removing the need for a separate power supply for a network device. IEEE 802.3af defines a standard protocol to be used by power sourcing equipment (PSE) and powered devices (PD). The Extreme Networks Summit 300-48 is IEEE 802.3af compliant and can provide inline power to the Avaya 4600 Series IP Telephones and Avaya Wireless Access Points, which are IEEE 802.3af compliant PDs.

The Avaya product configurations addressed by these Application Notes are shown in **Figure 1**. The following Avaya products are directly connected to the switch:

- Avaya 4602 and 4602SW IP Telephones
- Avaya 4610SW IP Telephone
- Avaya 4620 IP Telephone with and without EU24
- Avaya 4620SW IP Telephone with and without EU24
- Avaya 4630SW IP Telephone
- Avaya Gen-1 4612 and 4624 IP Telephones with Avaya 30A Switch Bases
- Avaya Gen-2 4606, 4612, and 4624 IP Telephone
- Avaya Wireless AP-4 /5/6 802.11a/b/g Access Point

The Avaya Gen-1 4612 and 4624 IP Telephones require the Avaya 30A Switch Base. **Figure 2** shows the connections for the 30A switch base. The Avaya 4612 and 4624 Telephones can be identified as Gen-1 or Gen-2 by inspecting the model number. "1A" in the model number indicates Gen-1; "2A" indicates Gen-2. The model number can be found by:

- Inspecting the label attached to the bottom of the Telephone.

OR

- Pressing **Mute**, **V**, **I**, **E**, **W, #** on the keypad and then pressing ***** until the model number appears. Press **#** to exit.

Examples of model numbers are "4612D0**1A**-003" (Gen-1) and 4612D0**2A**-003 (Gen-2).

The powering tests included verification of the following after the product was connected to the switch:

- Successful boot operation
- For Avaya IP Telephones, successful registration with Avaya Communication Manager and completion of a test call
- For Wireless LAN Access Points, successful registration for an Avaya IP Softphone with Avaya Communication Manger and completion of a test call.

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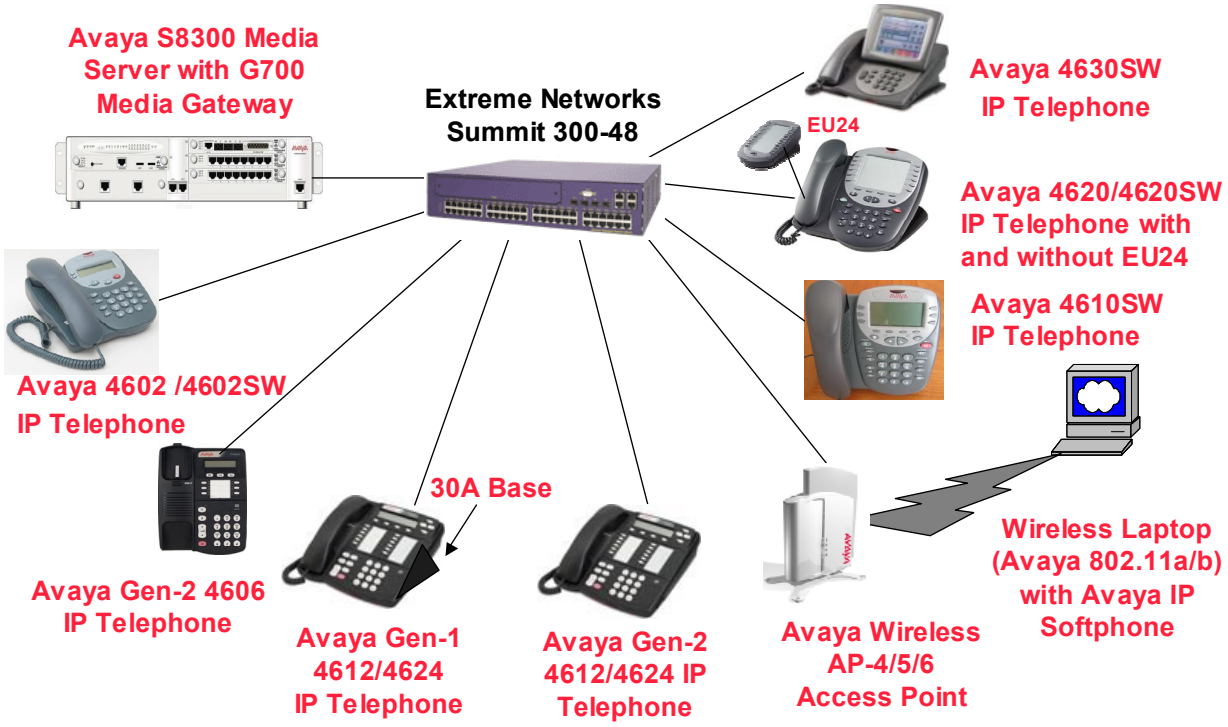
Avaya S8300 Media Server with G700 Media Gateway
Extreme Networks Summit 300-48
Avaya 4630SW IP Telephone
EU24
Avaya 4620/4620SW IP Telephone with and without EU24
Avaya 4610SW IP Telephone
Avaya 4602 /4602SW IP Telephone
30A Base
Wireless Laptop (Avaya 802.11a/b) with Avaya IP Softphone
Avaya Gen-2 4606 IP Telephone
Avaya Gen-1 4612/4624 IP Telephone
Avaya Gen-2 4612/4624 IP Telephone
Avaya Wireless AP-4/5/6 Access Point

Figure 1: Avaya 4600 Series IP Telephone and Wireless Access Point Configurations with the Extreme Networks Summit 300-48

Figure 2: Avaya 30A Switch Base Connections

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2. Equipment and Software Validated

The following equipment and software were used for the sample configuration provided:

Network Component	Software Version
Avaya 4602, 4602SW IP Telephones	1.8
Avaya 4610SW IP Telephone	2.0
Avay 4620 and 4620SW IP Telephones with and without EU24	2.0
Avaya 4630SW IP Screenphone	2.0
Avaya 4606 “Gen2” IP Telephone	1.8
Avaya 4612 “Gen1” IP Telephone	1.8
Avaya 4624 “Gen1” IP Telephone	1.8
Avaya 4612 “Gen2” IP Telephone	1.8
Avaya 4624 “Gen2” IP Telephone	1.8
Avaya Wireless AP-4/5/6 Access Point	V2.4.5(758)
Avaya 802.11a/b Wireless Card	2.0.306.0
Avaya Communication Manager (Avaya S8300 Media Server)	R012x.00.1.221.1
Extreme Networks Summit 300-48 PoE firmware revision	6.2a-1.1.2(Build 361) 2.15

Table 1 - Network Component Software Versions

3. IEEE 802.3af PoE implementation on the Avaya PDs and Extreme Networks PSE

In June 2003, the IEEE approved a standard for Power over Ethernet. The maximum power is 15.4W per PSE port and the maximum power delivered to a powered device, accounting for cable loss, is 12.95W. Optionally, powered devices may also be classified based on the maximum power the powered device will draw. Extreme Networks PSEs and Avaya PDs support this optional classification. The Extreme Networks Summit 300-48 can detect the Avaya PDs with the correct classification and can be configured to deliver the appropriate power.

The IEEE 802.3af classifications for the PSE and PD are given in **Table 2**.

Class	PSE Output Max. Power
0	15.4W
1	4.0W
2	7.0W
3	15.4W
4	Treat as Class 0

Table 2 - IEEE 802.3af PSE and PD Power Classifications

Table 3 shows the detected class, power allocated, and measured power by the Extreme Networks Summit 300-48 Switch for the Avaya IP Telephones and Wireless Access Points. The power was measured when the powered devices were idle.

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Avaya IP Telephones	Class	Power Allocated (Watts)	Power Measured (Watts)
4602	1	4	3.2
4602SW	2	7	3.3
4610SW	2	7	3.2
4620	3	15.4	6.9
4620 with EU24	3	15.4	7.6
4620SW	3	15.4	5.3
4620SW with EU24	3	15.4	6.0
4630SW	3	15.4	10.50
Gen-1 4612 with 30A	3	15.4	5.4
Gen-1 4624 with 30A	3	15.4	5.4
Gen-2 4606	0	15.4	4.7
Gen-2 4612	0	15.4	5.0
Gen-2 4624	0	15.4	5.0
Avaya AP-4/5/6	0	15.4	5.9

Table 3 - Class, Power Allocation and Power Measured for Avaya IP Telephone and Wireless Access Points

The following describes how the Extreme Summit 300-48 interacts with powered devices.

1. In order for any port to supply inline power, the system, slot and port must be enabled for power. Auto detection is enabled for all ports by default.

2. Port power budget is determined based upon the maximum class power levels or administered specification, not actual consumed power. It is recommended to configure inline power violation precedence to “advertised-class” so that the Summit 300-48 can allocate power based on the detected classes.

4. Configuring and Verifying Inline Power on the Extreme Summit 300-48

Use the command **show inline-power** to display inline power status information for the system. The following shows that PoE is enabled on the switch and the maximum internal inline power is 306 Watts. Depending on the mix of PoE classifications, this may not be enough to power all PDs on the 48 ports. The PoE firmware status is operational for Slot 1. The command **enable/disable inline-power** can be used to enable/disable PoE support on the switch.

```
Summit300-48:65 # show inline-power

                Inline-Power System Information
System maximum internal inline-power: 306 watts
System inline-power power-supply mode: redundant
System inline-power admin state: enabled
Power Usage Threshold: 70% (214 watts)
Disconnect-precedence deny-port
Inline-power SNMP traps enabled
```


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```
                Inline-Power Slot 1 Statistics

PoE firmware status  : Operational
PoE firmware revision: 2.15
PoE device revision  : 2
Port Connection Order:   3 1 2 4 6 7 8 5 9
Total ports powered: 9
Total ports waiting for power: 0
Total ports faulted: 0
Total ports disabled: 0
Total power available: 306 Watts
```

Use the command **show inline-power configuration slot 1** to verify that PoE is enabled for slot 1. The command **enable/disable inline-power slot <slotid>** can be used to enable/disable PoE support for the indicated slot.

```
Summit300-48:29 # show inline-power configuration slot 1
Slot  Status    Config Budget  Usage Threshold
1     Enabled         306W       70 % (214 W)
```

Use the command **show inline-power stats slot <slotid>** for the inline power statistics of the specified slot. The following screen shows that the allocated power is 130.2W and the actual power consumption is 52.4W.

```
Summit300-48:71 # show inline-power stats slot 1
        Common Power (mW)        Reserved Power (mW)
Slot  Configured   Allocated    Configured   Allocated   Actual usage
1      306000        130200         0           0         52400 / 130200 / 306000
```

Use the command **enable/disable inline-power ports <portlist>** to enable/disable for the listed ports.

It is recommended to configure inline power violation precedence to "advertised class" by the command **config inline-power violation-precedence advertised-class <portlist>**. The Summit 300-48 will then allocate power based on the detected classes. The following shows the configuration:

```
Summit300-48:79 # disable inline-power ports all
Summit300-48:80 # configure inline-power violation-precedence advertised-class ports all
Summit300-48:81 # enable inline-power ports all
```

Use the command **show inline-power configuration port <portlist>** to display the inline power configuration for the specified port(s). The Extreme Summit 300-48 supports port power priority

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and reserved power for a port. Refer to the Extreme Summit 300-48 administration guide for details.

```
Summit300-48:16 # show inline-power configuration ports 1:1-1:9
Port   Config   Priority  Detect Rsvd Pwr Oper Lmt Viol Prec   Label
 1:1   enabled   low       auto       0.0     15.4  advertise
 1:2   enabled   low       auto       0.0     15.4  advertise
 1:3   enabled   low       auto       0.0     15.4  advertise
 1:4   enabled   low       auto       0.0     15.4  advertise
 1:5   enabled   low       auto       0.0     15.4  advertise
 1:6   enabled   low       auto       0.0     15.4  advertise
 1:7   enabled   low       auto       0.0     15.4  advertise
 1:8   enabled   low       auto       0.0     15.4  advertise
 1:9   enabled   low       auto       0.0     15.4  advertise
```

Use the command **show inline-power stats port <portlist>** to show status for the specified port(s).

```
Summit300-48:6 # show inline-power stats ports 1:1-1:9
Port  State       Class  Absent  InvSig   Denied    OverCurrent    Short
1:1   delivering  class2      0       0        0              0        0
1:2   delivering  class3      0       0        0              0        0
1:3   delivering  class3      0       0        0              0        0
1:4   delivering  class3      0       0        0              0        0
1:5   delivering  class3      0       0        0              0        0
1:6   delivering  class0      0       0        0              0        0
1:7   delivering  class0      0       0        0              0        0
1:8   delivering  class0      0       0        0              0        0
1:9   delivering  class0      0       0        0              0        0
```

Use the command **show inline-power info detail ports <portlist>** for the detailed port power configuration and status. The following display shows that a Class 2 PD (Avaya 4610SW IP Telephone) is detected on port 1:1, Class 3 PDs (Avaya 4620/4620SW/4630SW/Gen-1 4612 with 30A switch IP Telephones) on ports 1:2 to 1:5 and Class 0 PDs (Avaya Gen-2 4606/4612/4624 IP Telephones/Avaya AP 4/5/6) on ports 1:6 to 1:9.

```
Summit300-48:90 # show inline-power info detail ports 1:1-1:9

Port - 1:1

Configured Admin State: Enabled
    Inline-Power State: delivering
     MIB Detect Status: delivering
                 Label:
  Violation Precedence: advertised-class
       Operator Limit: 15400 mW
            Detection: auto
```


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```
        Reserved Power: 0 mW
         Connect Order: 1
               PD Class: class2
       Max Class Power: 7.0 W
        Measured Power: 3.30 W
        Allowed  Power: 7.0 W
          Line Voltage: 51.0 Volts
 Discovered Resistance: 24.4 Kohms
Discovered Capacitance:    0 uF
               Current:   42 mA
          Fault Status: None (D 0)

Port - 1:2

Configured Admin State: Enabled
    Inline-Power State: delivering
     MIB Detect Status: delivering
                 Label:
  Violation Precedence: advertised-class
       Operator Limit: 15400 mW
            Detection: auto
        Reserved Power: 0 mW
         Connect Order: 2
               PD Class: class3
       Max Class Power: 15.400 W
        Measured Power: 6.90 W
        Allowed  Power: 15.400 W
          Line Voltage: 50.7 Volts
 Discovered Resistance: 24.4 Kohms
Discovered Capacitance:    0 uF
               Current:  112 mA
          Fault Status: None (D 0)

Port - 1:3

Configured Admin State: Enabled
    Inline-Power State: delivering
     MIB Detect Status: delivering
                 Label:
  Violation Precedence: advertised-class
       Operator Limit: 15400 mW
            Detection: auto
        Reserved Power: 0 mW
         Connect Order: 3
               PD Class: class3
       Max Class Power: 15.400 W
        Measured Power: 5.30 W
        Allowed  Power: 15.400 W
          Line Voltage: 51.0 Volts
 Discovered Resistance: 24.0 Kohms
Discovered Capacitance:    0 uF
               Current:   74 mA
          Fault Status: None (D 0)

Port - 1:4
```


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```
Configured Admin State: Enabled
    Inline-Power State: delivering
     MIB Detect Status: delivering
                 Label:
  Violation Precedence: advertised-class
        Operator Limit: 15400 mW
             Detection: auto
        Reserved Power: 0 mW
         Connect Order: 4
              PD Class: class3
       Max Class Power: 15.400 W
        Measured Power: 10.50 W
        Allowed  Power: 15.400 W
          Line Voltage: 50.7 Volts
 Discovered Resistance: 24.0 Kohms
Discovered Capacitance:    0 uF
               Current:  128 mA
          Fault Status: None (D 0)

Port - 1:5

Configured Admin State: Enabled
    Inline-Power State: delivering
     MIB Detect Status: delivering
                 Label:
  Violation Precedence: advertised-class
        Operator Limit: 15400 mW
             Detection: auto
        Reserved Power: 0 mW
         Connect Order: 5
              PD Class: class3
       Max Class Power: 15.400 W
        Measured Power: 5.90 W
        Allowed  Power: 15.400 W
          Line Voltage: 50.7 Volts
 Discovered Resistance: 22.8 Kohms
Discovered Capacitance:    0 uF
               Current:  116 mA
          Fault Status: None (D 0)

Port - 1:6

Configured Admin State: Enabled
    Inline-Power State: delivering
     MIB Detect Status: delivering
                 Label:
  Violation Precedence: advertised-class
        Operator Limit: 15400 mW
             Detection: auto
        Reserved Power: 0 mW
         Connect Order: 6
              PD Class: class0
       Max Class Power: 15.400 W
        Measured Power: 4.60 W
        Allowed  Power: 15.400 W
          Line Voltage: 50.7 Volts
```


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```
 Discovered Resistance: 24.8 Kohms
Discovered Capacitance:    0 uF
               Current:   92 mA
          Fault Status: None (D 0)

Port - 1:7

Configured Admin State: Enabled
    Inline-Power State: delivering
     MIB Detect Status: delivering
                 Label:
  Violation Precedence: advertised-class
       Operator Limit: 15400 mW
            Detection: auto
       Reserved Power: 0 mW
        Connect Order: 7
             PD Class: class0
       Max Class Power: 15.400 W
        Measured Power: 4.90 W
        Allowed  Power: 15.400 W
          Line Voltage: 50.7 Volts
 Discovered Resistance: 24.8 Kohms
Discovered Capacitance:    0 uF
               Current:   96 mA
          Fault Status: None (D 0)

Port - 1:8

Configured Admin State: Enabled
    Inline-Power State: delivering
     MIB Detect Status: delivering
                 Label:
  Violation Precedence: advertised-class
       Operator Limit: 15400 mW
            Detection: auto
       Reserved Power: 0 mW
        Connect Order: 8
             PD Class: class0
       Max Class Power: 15.400 W
        Measured Power: 5.0 W
        Allowed  Power: 15.400 W
          Line Voltage: 50.7 Volts
 Discovered Resistance: 24.8 Kohms
Discovered Capacitance:    0 uF
               Current:   98 mA
          Fault Status: None (D 0)

Port - 1:9

Configured Admin State: Enabled
    Inline-Power State: delivering
     MIB Detect Status: delivering
                 Label:
  Violation Precedence: advertised-class
       Operator Limit: 15400 mW
            Detection: auto
```


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```
         Reserved Power: 0 mW
          Connect Order: 9
                PD Class: class0
       Max Class Power: 15.400 W
        Measured Power: 6.0 W
        Allowed  Power: 15.400 W
          Line Voltage: 51.0 Volts
 Discovered Resistance: 24.4 Kohms
Discovered Capacitance:    0 uF
               Current:   78 mA
          Fault Status: None (D 0)
```

5. Interoperability Compliance Testing

This Interoperability Compliance Test included PoE testing between the Summit 300-48 and the Avaya 4600 Series IP Telephones and Avaya Wireless Access Points.

5.1. General Test Approach

PoE test cases based on **Figure 1** were performed manually. PoE worked as expected for the test cases, including plug/unplug the Avaya PDs, enable/disable PoE on the switch, and reset the switch.

5.2. Test Results

All test cases passed .No errors were detected. Extreme Networks Summit 300-48 can provide inline power to the Avaya IP 4600 series IP Telephones and Avaya Wireless Access Points successfully.

6. Support

Customers should call Extreme Networks Worldwide TAC when having problems related to Extreme Networks switches. Technical support is also available at the Extreme Networks web site at http://www.extremenetworks.com/services/wwtac/.
Product documentation for Extreme Networks can be downloaded via web at http://www.extremenetworks.com/services/documentation/.

7. Verification Steps

The following are verification steps for these Applications Notes:

- Connect Avaya IP Telephones to Extreme Networks Summit 300-48. Verify that the Avaya IP Telephones can be powered up properly.
- Verify that the Avaya IP Telephones can register with Avaya Communication Manager and calls can be made successfully.
- Use the command **show inline-power info detail ports <portlist>** on the Extreme Networks 300-48 to check the power status. If a port is in fault status, disable and enable inline power for the port.
- Reset the switch. Verify that all the IP Telephones can be powered up properly.

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8. Conclusion

Extreme Networks Summit 300-48 Switch was compliance tested with the Avaya IP 4600 Series Telephones and Wireless Access Points for PoE. All PoE functionality test cases completed successfully. Extreme Networks Summit 300-48 is IEEE 802.3af compliant and can provide inline power to the Avaya IP 4600 series IP Telephones and Avaya Wireless Access Points.

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